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EVALUATION OF A SOUTHERN PINE BEETLE OUTBREAK ON THE PEDLAR RANGER DISTRICT, GEORGE WASHINGTON NATIONAL FOREST, VIRGINIA, 1974

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INTRODUCTION

An aerial sketchmap and ground evaluation of southern pine beetle infestations was conducted on the Pedlar District (275,932 acres) of the George Washington National Forest during October and November of 1974. The purpose of the evaluation was to determine the current status and trend of the outbreak on the District.

The outbreak on the Pedlar District is part of a Southwide epidemic involving 10 states. The outbreak developed in early 1973 and increased gradually through May 1974 (Figure 1).

TECHNICAL INFORMATION

Insect - Southern pine beetle, *Dendroctonus frontalis* Zimm.

Hosts - Southern pine beetle is a native forest pest that will attack all species of southern yellow pine. However, loblolly pine, *Pinus taeda* L., and shortleaf pine, *P. echinata* Mill., are the preferred hosts.

Type of Damage - Death of the tree is the result of mining in the cambium by the southern pine beetle as it constructs egg galleries. The beetle also introduces blue stain fungi, *Ceratocystis* spp., which slow down or block conduction of water in the stem. The size of an infestation may range from a single tree to several thousand trees.

Life Cycle of the Beetle - Southern pine beetles attack in pairs and construct a winding gallery in the cambium. Eggs are deposited in niches along the sides of the galleries. The eggs hatch into whitish grubs that further mine the cambium and then construct cells in the bark where they pupate and change to adults. The new adults then mine through the bark to emerge. The complete life cycle takes about a month during the summer, and as many as four or five generations may be produced annually in the area.

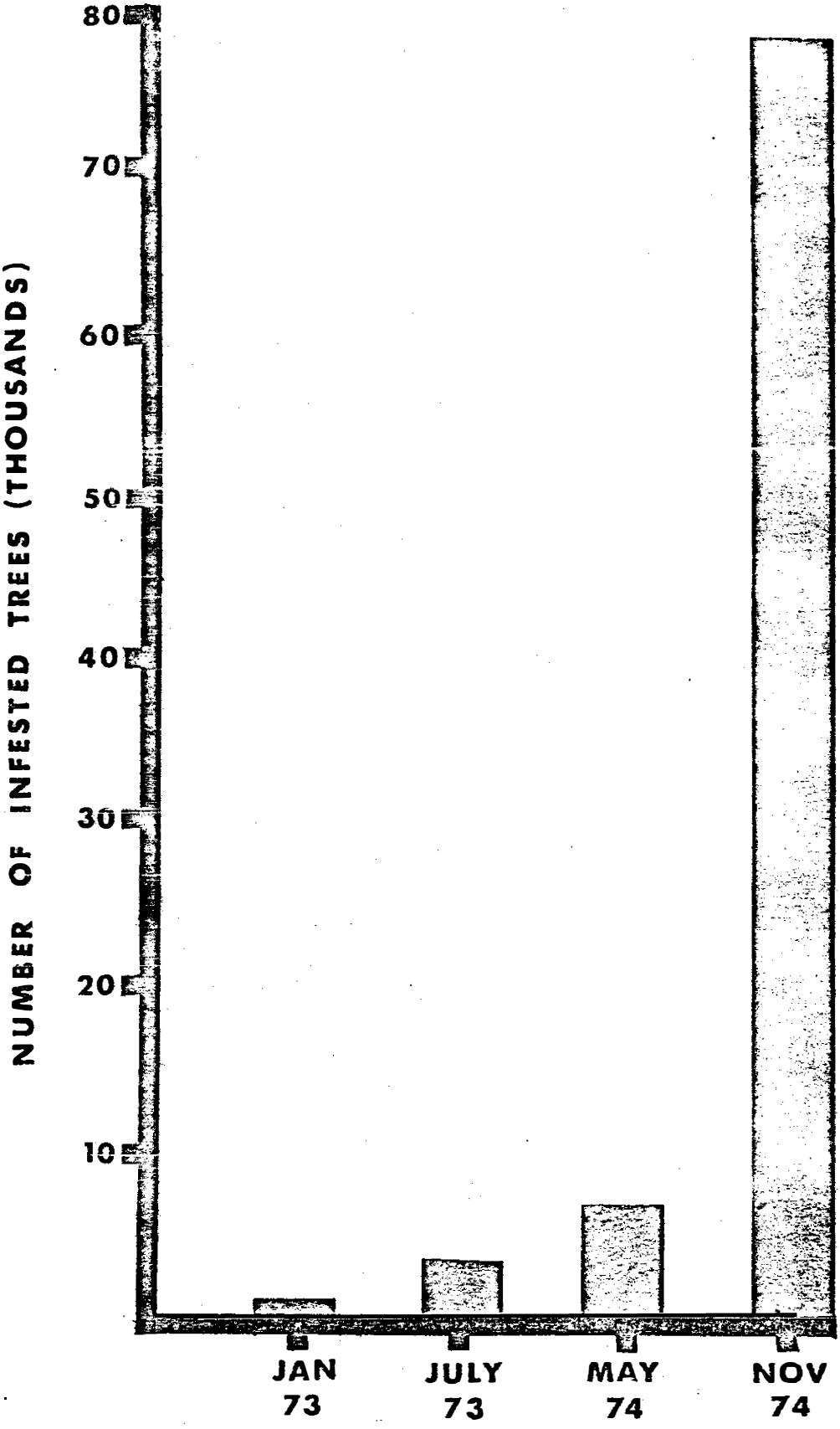

Figure 1. Total number of southern pine beetle infested trees on the Pedlar District, George Washington National Forest, for evaluations January 1973 to November 1974.

METHODS

A 50-percent aerial sketchmap survey and ground evaluation were made using standard evaluation procedures.[1,2/] Five spots of red and fading pine trees were checked on the ground to determine the cause of mortality, number of beetle infested trees, and the condition of the bark beetle brood.

RESULTS AND DISCUSSION

Results of this evaluation showed that the southern pine beetle outbreak on the Pedlar District is at a very high level (Tables 1 and 2). Analysis of aerial data showed approximately 62,000 red-topped trees on the survey area. The ground evaluation showed that 56 percent of the red-topped trees were actively infested, plus an additional 43,000 green infested trees. This totals approximately 78,000 infested trees on the District. This represents a tremendous increase in the severity of the beetle outbreak (Figure 1). The outbreak area has also expanded in size since May 1974 (Figure 2).

The high level of the outbreak at the present time poses a serious threat to the pine type in this area. Unless natural factors intervene, the outbreak is expected to continue at a very high level in 1975.

RECOMMENDATIONS

The southern pine beetle outbreak is expected to continue at a high level on the Pedlar District during 1975. At the current level, it is unlikely that a suppression project will stop the outbreak. However, a suppression program could substantially reduce tree mortality if executed properly. Infestations can be stopped in individual stands by using methods outlined in the 5250 section of the Forest Service Manual which are as follows:

1. Removal of Infested Trees by Commercial Sale or Administrative Use. When infested trees of merchantable size are accessible, they should be removed by commercial sale or administrative use procedures. Logging of the infested material should begin immediately. Contract time limits should insure rapid removal.

   Where practical, and if host type is present, a 40- to 70-foot buffer strip should be marked and cut adjacent to and ahead of the most

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1/ Detection of Forest Pests in the Southeast. USDA, USFS, SA, S&PF, Div. FPM-7, 1970.

2/ Evaluating Southern Pine Beetle Infestations. USDA, USFS, S&PF, Div. FPM-8, 1970.

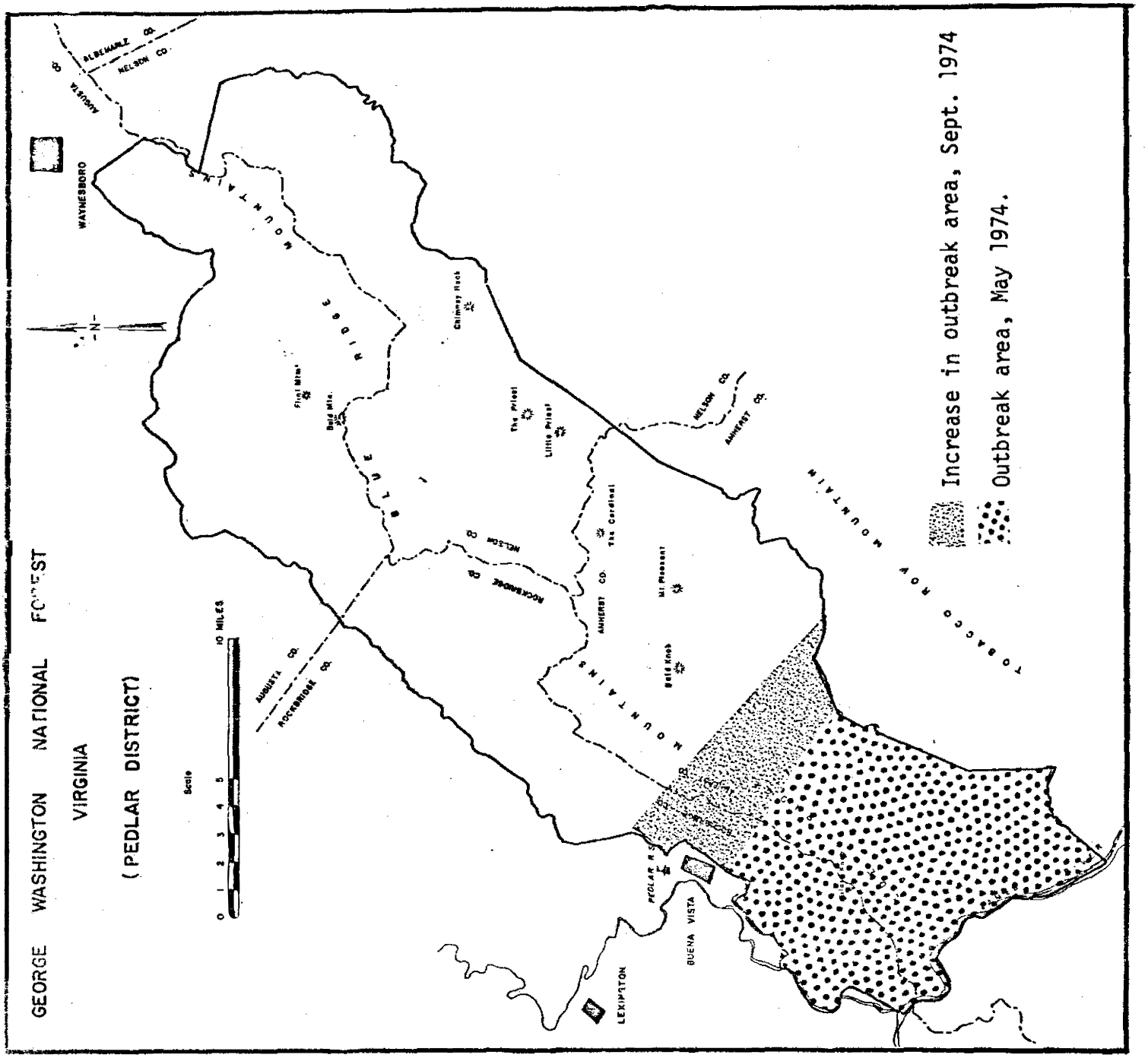

Figure 2. Location of southern pine beetle infestations, Pedlar Ranger District, George Washington National Forest, Virginia, September 16, 1974.

Table 1. Summary of the results of southern pine beetle evaluation on the Pedlar Ranger District, George Washington National Forest, October-November 1974.

1. Results compiled from data collected during the aerial phase of the evaluation:	
Survey type	Sketchmap
Date of aerial survey	9/16/74
Total acreage in outbreak area	34,594
Total acreage of susceptible host type in outbreak area	11,680
Total number of spots within the outbreak area	187
Spots per M acre of host type	16.0
Average spot size (trees)	342
Range of spot sizes (trees)	1-10,000
2. Results compiled from data collected during the ground and aerial phases of the evaluation:	
Date of ground phase	10/9/74
Infested trees per M acre of host type	6,725
Total number of infested trees within the survey boundary	78,558
Ratio of green infested to total red and fading trees	1:1.5
Total volume of infested trees	1,418,578 cu. ft.

Table 2. Summary of Aerial Survey Data[1/] - Pedlar Ranger District, George Washington National Forest, Virginia, October-November 1974.

Infestation Size (# Trees)										
	2-5		6-20		21-50		50+		Total	
Singles	Spots	Trees	Spots	Trees	Spots	Trees	Spots	Trees	Spots	Trees
0	9	40	50	60	44	1,768	84	62,000	187	63,868

1/ Corrected according to data by Aldrich et. al. (1958); expanded to a 100-percent survey area coverage.

recently infested trees. This practice is effective in reducing the possibility of "breakouts". When only a small volume of infested merchantable material occurs in a spot, noninfested trees surrounding the spot may be marked to provide an operable cut.

The order of priority for removing beetle infested timber from a spot should be as follows:

Trees having nearly developed broods (usually the red and fading trees).

Trees having young broods (usually the green, recently infested trees).

Trees in the buffer zone.

2. Piling and Burning. Unmerchantable or inaccessible southern pine beetle infestations can be suppressed by cutting, piling, and thoroughly burning the bark of infested trees. The entire bark surface must be thoroughly burned to insure effective control. The order of priority for cutting, piling, and burning infested trees, particularly in large spots, is the same as paragraph (1) under removal of infested trees by commercial sale or administrative use. Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts" every effort should be made to locate and treat all green infested trees during the piling and burning operation.

3. Chemical Control. Chemical formulation recommended for southern pine beetle control is a 1/2 percent Lindane spray with No. 2 fuel oil as the carrier. This may be formulated from a 20 percent Lindane emulsifiable concentrate or oil concentrate at the rate of 11 pints of concentrate in enough fuel oil to make 55 gallons of spray. (Ratio of one part 20 percent Lindane EC to 39 parts No. 2 diesel fuel.)

Cut, limb and buck all infested trees into workable lengths. Spray the infested bark surface to the point of run-off. A compressed air sprayer (3-gallon capacity or equivalent) is an ideal applicator. Infested logs must be turned two or three times to insure complete treatment of infested bark. Spray stumps and bark removed by woodpeckers. Low pressure sprayers may be used to treat large, accessible infestations.

The order of priority for cutting and spraying infested trees in large spots is the same as paragraph (1) under removal of infested trees by commercial sale or administrative use. Cutting a buffer strip is not recommended. To reduce the possibility of "breakouts" every effort should be made to locate and treat all green infested trees during the chemical control operation.

Never spray trees from which southern pine beetle brood has emerged. Natural enemies of the southern pine beetle in these trees can then complete their development. To prevent aerial spotters from mapping treated spots cut trees with red needles from which beetles have emerged.

Instructions for minimizing the adverse effects of mixing, transporting and storing pesticides, applying pesticides and disposing of pesticide containers and excess chemicals are outlined in section 8.3 of the Forest Service Health and Safety Code and FSM 5242.21. Detailed safety procedures should be outlined in the project suppression plan.

4. Reexamination of Treated Areas. Reexamine areas where infested trees were removed by commercial sales, piled and burned or chemically treated within two or three weeks after treatment to check for additional infested trees. If additional trees are found, treat them.

PRECAUTIONARY PESTICIDE USE STATEMENT

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels. Store pesticides in original containers under lock and key—out of the reach of children and animals—away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump, or crush and bury them in a level, isolated place.